

CLAIMS:

1. A pneumatic or hydraulic cylinder having a longitudinal axis and to be activated by a fluid under pressure, the cylinder including:

a barrel having a bore;

5 a piston rod slidably and sealingly located in the bore and co-operating therewith to provide a variable volume chamber into which the fluid under pressure is delivered to move the piston rod to change said volume;

a port in communication with said chamber and via which the fluid is allowed to pass;

10 a lock assembly mounted on the piston rod, the assembly including:

at least one lock member movable relative to said axis between a radially inner position permitting movement of the piston rod, and a radially outer position engaging the barrel to prevent movement of the piston rod in a predetermined direction beyond a predetermined longitudinal position;

15 a retaining member mounted on the piston rod and movable longitudinally relative thereto between a first position retaining the lock member in the radially outer position, and a second position providing for movement of the lock member to the radially inner position;

means to urge the retaining member to the first position thereof to thereby urge
20 said locking member to the radially outer position; and

wherein said retaining member when in said first position and exposed to the fluid under pressure is moved to the second position thereof to allow movement of the lock member to the radially inner position to free said piston rod for movement in said direction.

25 2. The cylinder of claim 1, wherein the retaining member is moved to the second position by fluid under pressure in said chamber.

3. The cylinder of claim 1 or 2, wherein said retaining member is a sleeve surrounding the piston rod, said sleeve having a longitudinally extending portion which,

when said retaining member is in the first position, is radially aligned with said lock member, thus retaining the lock member in the radially outer position.

4. The cylinder of claim 1, 2 or 3. wherein said lock member is spherical in configuration.

5. The cylinder of claim 4, wherein said lock member is a first lock member, and said cylinder includes further lock members, all the lock members being spherical in configuration with the same diameter, the lock members being angularly displaced about said axis.

6. The cylinder of any one of claims 1 to 5, wherein said bore includes an annular ramp surface joining a first bore length to a second bore length, the first bore length having a greater radius than the second bore length, with said lock member/s engaging the first bore length to be located in the radially outer position, and engaging the second bore length to be located in the radially inner position.

7. The cylinder of any one of claims 1 to 6, wherein the means to urge is a spring extending between said retaining member and piston rod.

8. The cylinder of any one of claims 1 to 6, wherein the surface of the means to urge is pressure applied to a surface of the retaining member.

9. The cylinder of claim 5, wherein said cylinder includes a cage member providing a plurality of apertures extending radially with respect to said axis, each aperture receiving a respective one of the locking members.

10. The cylinder of claim 9, wherein said cage member is provided with a cage portion and said retaining member is slidably mounted in said cage member.

11. The cylinder of claim 10, wherein said cage member includes a chamber within which said retaining member is slidably mounted, with the cage member chamber receiving the fluid under pressure to cause longitudinal movement of the retaining member to the first position thereof.

12. The cylinder of claim 9, 10 or 11, wherein said retaining member has a ramp surface to engage the lock member/s to cause radial movement thereof to the radially outer portion.

13. The cylinder of any one of claims 1 to 12, wherein said chamber is a first chamber, and said cylinder includes a second chamber which is sealing separated from the first chamber.

14. The cylinder of claim 13, wherein fluid under pressure delivering to said first chamber causes movement of the piston rod in said predetermined direction while if delivered to said second chamber causes the piston rod to move in a direction opposite to said predetermined direction.

15. The cylinder of any one of claims 1 to 14, wherein said retaining member moves in said predetermined direction relative to said piston rod when moving from the first position to the second position.

16. The cylinder of any one of claims 1 to 15, wherein the cylinder includes a rod chamber that moves with the piston rod and wherein said retaining member is slidably received in said rod chamber and receives the fluid under pressure to move said retaining member to the first position thereof.